

**Abstract**

The present invention relates, generally, to a method and apparatus for electrowinning metals, and more particularly to a method and apparatus for copper electrowinning using the ferrous/ferric anode reaction. In general, the use of a flow-through anode—coupled with an effective electrolyte circulation system—enables the efficient and cost-effective operation of a copper electrowinning system employing the ferrous/ferric anode reaction at a total cell voltage of less than about 1.5 V and at current densities of greater than about 26 Amps per square foot (about 280 A/m<sup>2</sup>), and reduces acid mist generation. Furthermore, the use of such a system permits the use of low ferrous iron concentrations and optimized electrolyte flow rates as compared to prior art systems while producing high quality, commercially saleable product (*i.e.*, LME Grade A copper cathode or equivalent), which is advantageous.

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